Department of Energy
Fermi Area Office
Post Office Box 2000
Batavia, Illinois 60510

DEC 0 2 2005

Mr. Gerald C. Brown, Associate
Director for Operations Support
Fermilab
P.O. Box 500
Batavia, IL 60510

Dear Mr. Brown:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DETERMINATION AT FERMI NATIONAL ACCELERATOR LABORATORY - "Main Injector Neutrino ExpeRiment v-A (MINERvA)"

Reference: Letter, G. Brown to J. Livengood, dated November 14, 2005, Subject: Same As Above

I have reviewed the Fermilab Environmental Evaluation Notification Form (EENF) for the subject proposed project transmitted by your referenced letter. Based on the information provided in the EENF, I have approved the following project as a categorical exclusion (CX):

Project Name	Approved	CX (s)
Main Injector Neutrino ExpeRiment v-A (MINERvA)	11/30/2005	B3.10

I am returning a signed copy of the EENF for your records. No further NEPA review is required. This project falls under a categorical exclusion(s) provided in 10 CFR 1021, as amended in 1996.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Site Manager

Enclosure:
As Stated

cc: P. Oddone, w/o encl.
K. Stanfield, w/o encl.
B. Chrisman, w/o encl.
C. Trimby, w/o encl.
T. Dykhuis, w/o encl.
B. Griffing, w/encl.
D. Harris, PPD, w/encl.

FERMILAB ENVIRONMENTAL EVALUATION NOTIFICATION FORM

Project/Activity Title: Main Injector Neutrino ExpeRiment v-A (MINERvA)
ES&H Tracking Number: 01054 **Funding Source:** MIE
Fermilab Project Manager: Deborah Harris (X4545)

Signature Deborah A Harris

Date 11/9/05

Fermilab NEPA Reviewer: Teri Dykhuis

Signature Teri L. Dykhuis

Date 11/11/05

I. Description of the Proposed Action and Need

The purpose and need for the proposed MINERvA (Main Injector ExpeRiment: v-A) project is to enable the MINERvA collaboration of elementary particle and nuclear physics groups and institutions to perform a high statistics neutrino-nucleus scattering experiment using a fine-grained detector located on-axis, upstream of the MINOS near detector. This proposed project is a neutrino experiment that would measure neutrino cross sections and nuclear interactions with unprecedented precision using the NuMI beam. Further details may be found in the MINERvA proposal (http://minerva.fnal.gov/proposal.pdf).

The project would include the development and installation of a neutrino detector to be located in the existing MINOS detector hall at Fermilab, directly upstream of the MINOS near Detector. The proposed detector would be constructed primarily of steel and plastic scintillator, although it would also contain some target plates of lead and graphite. When completed, it would have the shape of a hexagonal cylinder aligned along the NuMI beamline, comprised of a number of planes hung on a steel support structure in a manner similar to MINOS. Its dimensions would be approximately 6 meters long by 4 meters wide by 4 meters high, with a total mass of approximately 300 metric tons. The assembly would employ cranes, hoists and techniques similar to those used in the installation of MINOS. Although no new construction is contemplated for MINERvA, the detector would require some upgrades to the infrastructure of the MINOS hall, which is approximately 100 meters underground. These upgrades may include additional electric power and/or cooling capacity, as well as an extension of the hall's drip ceiling. Finally, although much of the research and subassembly work would be done at collaborating universities, some of this work would be done in existing laboratory facilities on the Fermilab site. Laboratory space has not yet been assigned to MINERvA but the Wide-Band Lab is a candidate site. The assembly of the detector would include transport of the components from on-site and off-

site facilities to the MINOS building and lowering them into the MINOS hall via the MINOS shaft.

The NuMI beam is presently the most intense source of neutrinos in the world. The existing experimental hall and its infrastructure is the only location that allows full exploitation of this facility. Hence, there is no alternative as far as location is concerned. The detector would be composed primarily of steel and plastic scintillator and is similar in many ways to the existing MINOS detectors. Several technological alternatives for this type of detector were considered for MINOS, including gas-filled wire chambers and liquid scintillator as the active component of the detector. These were rejected in favor of plastic scintillator, partly out of ES&H considerations. As well as providing significant scientific results in its own right, the data from this experiment are intended to supplement and enhance the results of MINOS and, if approved, the NOvA experiment as well. The 'No Action' alternative would not accomplish the identified purpose and need for the action stated above.

II. Description of the Affected Environment

The magnitude of MINERvA's environmental impact is expected to be very slight, as it does not involve the construction of any new facilities. It would, however, necessitate upgrades to the infrastructure of existing facilities. Specifically, the drip ceiling in the MINOS hall would be extended to cover the entire hall. This work would be done under a fixed-price contract with a construction contractor. Additionally, cooling for the MINERvA power supply may result in an increase in the water temperature of the MINOS sump. The detector would contain 3.5 metric tons of lead; the lead would be painted and hermetically enclosed in the detector and precautions would be taken during the detector assembly to minimize the possibility of any lead contamination. Because the NuMI beam consists of neutrinos, radioactivation issues in the experimental hall is not anticipated.

III. Potential Environmental Effects (Provide comments for each checked item and where clarification is necessary.)

A. Sensitive Resources: Will the proposed action result in changes and/or disturbances to any of the following resources?

- ☐ Threatened or endangered species
- ☐ Other protected species
- ☐ Wetland/Floodplains
- ☐ Archaeological or historical resources
- ☐ Non-attainment areas

B. Regulated Substances/Activities: Will the proposed action involve any of the following regulated substances or activities?

- ☐ Clearing or Excavation
- ☐ Demolition or decommissioning
- ☐ Asbestos removal
- ☐ PCBs
- ☒ Chemical use or storage
- ☐ Pesticides
- ☐ Air emissions
- ☒ Liquid effluents
- ☐ Underground storage tanks
- ☐ Hazardous or other regulated waste (including radioactive or mixed)
- ☐ Radioactive exposures or radioactive air emissions
- ☐ Radioactivation of soil or groundwater

C. Other relevant Disclosures

- ☐ Threatened violation of ES&H permit requirements
- ☐ Siting/construction/major modification of waste recovery or TSD facilities
- ☐ Disturbance of pre-existing contamination
- ☐ New or modified permits
- ☐ Public controversy
- ☐ Action/involvement of another federal agency
- ☐ Public utilities/services
- ☐ Depletion of a non-renewable resource

IV. NEPA Recommendation

Fermilab has reviewed this proposed action and conclude that the appropriate level of NEPA determination is a Categorical Exclusion. The conclusion is based on the proposed action meeting the applicable requirements in DOE's NEPA Implementation Procedures, 10 CFR 1021, Subpart D, Appendix B3.10.

V. DOE/CH-FAO NEPA Coordinator Review

Concurrence with the recommendation for determination:

NEPA Coordinator reviewer Jonathan Cooper

Signature Jonathan P. Cooper

Date 11/29/05

Fermi Area Manager Dr. Joanna M. Livengood

Signature Joanna M. Livengood

Date 12/1/05

VI. Comments on checked items in section III.

Chemical Use

Some small amounts of chemicals, e.g. isopropyl alcohol for wipe-cleaning (the process of degreasing via wipe cleaning is exempt from the need to be included in the site-wide air permit), may be used in the surface laboratories on the Fermilab site.

Liquid Effluents

Cooling water (if any) is directed to the MINOS sump, from which it would be pumped into the ICW system. Although the operation of the NuMI beam does generate radioactivity and radioactive effluents, it is not a part of the MINERvA Project per se and would continue to operate for MINOS (and possibly NOvA) whether MINERvA goes forward or not.